Local Water Supply Project Feasibility Studies

Loan Application

Water Conservation Bond Law of 1988

California Department of Water Resources
Division of Planning and Local Assistance

Revised January 2003

Introduction

The Water Conservation Bond Law of 1988 *(Proposition 82)* provides $20,000,000 for loans to assist local agencies in planning and constructing facilities to develop new local water supplies. The Bond Law establishes a limit of $2,000,000 (ten percent of the total) for financing feasibility studies and $500,000 for a single study.

The interest rate for these loans will be equal to the interest rate that the State pays on the general obligation bonds sold to finance the program.

Feasibility studies demonstrate whether a proposed project is feasible in its engineering, hydrologic/hydrogeologic, environmental, economic, and financial aspects. The results of a feasibility study should provide the data necessary to develop a complete construction loan application. A construction loan application may be obtained from the Department of Water Resources (DWR) as a guide in preparing the feasibility study work plan.

An applicant may not simultaneously request loans for both a feasibility study and project construction for a single project. **This application is only for those seeking a feasibility study loan**. A construction loan application is available from the Department of Water Resources for those seeking a construction loan. Contact one of the staff listed on page vii to receive a construction application package.

This local water supply project feasibility study loan application and copies of the local water supply project construction loan application are available on our web site at: **www.water.ca.gov/grants-loans.**

The applicant agency will be responsible for repaying the feasibility loan.

Agencies must submit the attachments identified and described in Parts A through C of this application.

Table of Contents

General Instructions

Who may apply?
Local agencies are eligible for loans under this program. A local agency is any city, county, city and county, district, joint powers authority, or other political subdivision of the State involved in water management. The applicant agency will be responsible for repaying the loan.

Eligible projects
An eligible project may include a canal, dam, reservoir, desalination facility, groundwater extraction facility, or other construction or improvement, including rehabilitation of a dam for water supply purposes by a local agency for the diversion, storage, or distribution of water which will remedy **existing** water supply problems. This may also include any such project for the storage or distribution of reclaimed water for reuse.

A project will **not be eligible for a loan** if more than 50 percent of its expected benefits would result from hydroelectric power generation. Loan funds are not available for the development of recreation facilities.

Any part or all of the project facilities, including land under the facilities, may consist of separable features or an appropriate share of multipurpose features of a larger system or both.

This application is only for those seeking a loan for a feasibility study of an eligible project, as described above.

More detailed descriptions are provided in each relevant section of this application.

Completed applications will be evaluated on a "first come, first served" basis. Funding approval for individual loans must be obtained by the Department of Water Resources from the California Water Commission and Legislature.

Help filling out the application
The Department of Water Resources needs specific information to evaluate your loan request. For help in completing the application, contact the following:

Questions about Part A should be referred to:

Linda Buchanan
Department of Water Resources
Division of Planning and Local Assistance
Loans and Grants Program
Phone: (916) 651-9645
Fax: (916) 651-9607

Questions about Parts B and C should be referred to:

Department of Water Resources
Division of Planning and Local Assistance
Loans and Grants Program
David A. Rolph
Phone: (916) 651-9635
Fax: (916) 651-9607

Submitting the application

The forms and attachments as described in this booklet are required for a completed application. Please submit four *(4)* copies of the application to:

Department of Water Resources
Division of Planning and Local Assistance
Loans and Grants Program
Post Office Box 942836
Sacramento, CA 94236-0001
Attention: Linda Buchanan

Part A - Organizational, Financial and Legal Information

A-1
Application cover sheet
State of California, The Resources Agency, Department of Water Resources

Application for a feasibility study loan for local water supply facilities under the Water Conservation Bond Law of 1988

The _____
(Exact legal name of agency applying for and repaying loan)

of _____
(Mailing address of agency)

of the County of _____ State of California, does hereby apply to

the California Department of Water Resources for a loan in the amount of $ _____

for the following feasibility study under the Water Conservation Bond Law of 1988:

_____
(Specify feasibility study title)

Requested repayment term is _ years (not to exceed five years)

The application is to study:
☐ Construction of a canal
☐ Construction of a groundwater extraction facility
☐ Construction of a dam
☐ Rehabilitation of a dam
☐ Distribution system
☐ Other (describe) _____

By _____ Date _____
(Signature of authorized representative, see Section A-4, page 9)

_____
(Print or type name of authorized representative)

Title _____

Telephone (___) _____

Fax (___) _____

E-mail _____

A-2
Agency representatives

Project contact person: Name _____

Title _____

Telephone (___) _____

Fax (___) _____

E-mail _____

Alternate contact person: Name _____

Title _____

Telephone (___)_____

Fax (___)_____

E-mail _____

Type of Organization: _____

(Water district, irrigation district, city, etc.)

California Assembly Representative: _____

District No. _____

California Senate Representative: _____

District No. _____

Attach a copy of agency charter and the names and titles of agency officers.

Mark as Attachment A-2.

A-3
Feasibility study cost

1) Prepare a proposed feasibility study budget itemized by task. Contingency costs must be included in the budget. These contingency costs must be a minimum of 7.5 percent of the total cost of the study.

2) Provide financing information about the proposed feasibility study *(see below)*.

Mark the itemized budget and financing information as Attachment A-3.

Total cost of feasibility study: $_____

Amount of study to be funded under the Water Conservation and Water Quality Bond Law of 1988: $_____

Requested repayment term (5-year maximum): ___ *(Years)*

Amount to be funded by the agency: $_____

Indicate source of funds: _____

Amount to be funded externally: $_____
(Include any other pending applications)

Lender: _____ Lender: _____

Amount: $_____ Amount: $_____

Interest Rate: _____ *Percent* Interest Rate: _____ *Percent*

Term: _____ *Years* Term: _____ *Years*

Annual Payment: $_____ Annual Payment: $_____

A-4
Authorizing resolution

Include a resolution adopted by the agency's governing body authorizing the application for a Local Water Supply feasibility study loan under this program and designating a representative to sign the application. Appendix II on page A-5 is a suggested resolution format.

Mark as Attachment A-4.

A-5
Financial statements

Attach copies of financial statements for the last three fiscal years of agency operation. Include balance sheets, income statements, sources and uses of funds statements, and the most recent annual budget.

Mark as Attachment A-5.

A-6
Cash reserves

List all cash reserves *(restricted and unrestricted)* and any planned uses of those reserves.

Mark as Attachment A-6.

A-7
Existing debt

Summarize all existing agency long-term indebtedness, including bonds and any pending indebtedness *(e.g., U.S. Department of Agriculture Rural Development loans or Economic Development Agency loans)*. If necessary, include additional pages. **Mark as Attachment A-7.**

Lender:	Lender:	Lender:
Original Principal $_____ Purpose: _____ Original Date: _____ Original Terms: Percent ____ Years _____ Annual Payment _____ Current Principal $_____ Remaining years to pay _____	Original Principal $_____ Purpose: _____ Original Date: _____ Original Terms: Percent ____ Years _____ Annual Payment _____ Current Principal $_____ Remaining years to pay _____	Original Principal $_____ Purpose: _____ Original Date: _____ Original Terms: Percent ____ Years _____ Annual Payment _____ Current Principal $_____ Remaining years to pay _____

Has this agency ever issued bonds or notes for debt? Yes ☐ No ☐
If yes, provide the following information for the two most recent issues:

Purpose	Purpose
(Check one) ☐ General Obligation ☐ Revenue Bond Principal Amount $ _____ Interest Rate True interest cost _____ Net interest cost _____	*(Check one)* ☐ General Obligation ☐ Revenue Bond Principal Amount $ _____ Interest Rate True interest cost _____ Net interest cost _____
Terms _____ Date of Issue _____ Rating _____ Rating Agency _____	Terms _____ Date of Issue _____ Rating _____ Rating Agency _____

How will the proposed DWR loan affect long-term and short-term financial capacity *(qualitatively/quantitatively)*?

_____

_____

Current debt-to-income ratio (percent) : _____ After proposed construction loan (percent) : _____

A-8
Repayment method

Indicate the agency's proposed method to repay the feasibility study loan:

☐ 1. Standby charges

☐ 2. Excess revenues
Source: _____

_____

_____

☐ 3. Cost savings

☐ 4. User fees
☐ Flat rate
☐ Quantity of water used

☐ 5. Assessments

☐ 6. Other
Describe: _____

_____

_____

If methods 1, 4, or 5 are to be used to repay the loan, include a plan to divide costs among the system users. Use dollar estimates.

Mark as Attachment A-8.

A-9
Loan security

Explain how the agency proposes to secure this loan if required to do so by the State (dedicated revenues, assessments, etc.). Cite statutory authority to use this method to secure the loan.

Mark as Attachment A-9.

A-10
Rate and service structure

Attach the agency rate structure for the last three *(3)* years.

Mark as Attachment A-10.

Estimated average monthly water bill: $_____

Residential Average month: _____	Agricultural Average month: _____ *(per acre-foot)*
Peak month: _____ _____ *Year*	Peak month: _____ _____ *Year*

Total possible nonagricultural connections in service area:_____

Number of undeveloped parcels in service area: _____

Number of developed residential parcels: _____

Number of developed commercial parcels:_____

Indicate the approximate number of actual connections for the date and year listed below:

Number of Connections

Year/Date	Residential	Other
12/31/Current Year (CY)		
12/31/CY + 1*		
12/31/CY + 2*		
12/31/CY + 3*		
12/31/CY + 4*		

**Estimate*
Volume of water delivered through system per year: _____

A-11
Population data *(not applicable for agricultural projects)*

Total population of service area that will repay the loan

Year-round/Permanent: _____ As of: _____
(Date)

Seasonal/Part-time: :_____ As of: _____
(Date)

Seasonal peak population *(if applicable)*: _____

Persons per household:_____

Source of above information: _____

_____

Projected population:

Current Year + 5 _____
Current Year + 10 _____

Source of above information: _____

_____

Household median income of water service area:

Amount: $_____ As of _____
(Date)

Source of above information: _____

_____

County median income *(available from the county planning department)***:**

Amount: $_____ As of _____
(Date)

Source of above information: _____

_____

What tax rate areas are included in the area to benefit from or pay for the project?
(This information is available from the county assessor.)

_____

_____

A-12
Agency authority

Attach a written opinion from the agency attorney answering the following six questions pertaining specifically to this loan application. For each question, cite statutory authority or other references.

1. Does the agency have the legal authority to enter into a loan contract with the State of California, such as this application? Cite the statutory authority under which the agency may borrow funds for the purpose, amount, and duration requested.

2. What is the statutory authority under which the agency was formed and is authorized to operate?

3. Is the agency required to hold an election before entering into a loan contract with the State? Cite the statutory authority or other references.

4. Does the agency have the legal authority to levy assessments and/or charges sufficient to repay the proposed State loan? (Also address Loan Security, Part A-9.)

5. Will a loan agreement between the agency and the State of California be subject to review and/or approval by other government agencies? Identify all such agencies *(e.g., Local Area Formation Commission, local governments, U.S. Forest Service, California Coastal Commission, Health Services, etc.).*

6. Describe any pending litigation that impacts the financial condition of the agency or the operation of the water facilities. If none is pending, so state.

Mark as Attachment A-12.

Part B-Feasibility Study Requirements

B-1
Types of eligible feasibility studies

Eligible Local Water Supply feasibility studies are studies of proposed projects that involve increasing an applicant's local water supplies in order to address existing water supply problems. This includes increasing the production of water supplies or expanding existing water storage capacity.

Eligible feasibility studies may include, but are not limited to, the study of the following local water supply facilities:

- Dams/reservoirs (including off-stream storage)
- Diversion facilities
- Groundwater extraction facilities/well-field development
- Conveyance facilities (canals and pipelines)
- Desalination/groundwater recovery
- Water storage tanks
- Reclaimed water distribution and storage facilities

Feasibility studies that are **not eligible** for funding under this program include studies of proposed projects involving water conservation or groundwater recharge facilities.

B-2
Map and narrative description of proposed project
Provide a detailed map of the study area, preferably a 1:24,000 scale copy or original of a 7.5-minute USGS quad sheet. Provide a detailed narrative description of the proposed project. Discuss the purpose and goals of the proposed project in the context of the applicant's water management plans, and the project alternatives that will be evaluated.

Mark as Attachment B-2.

B-3
Work plan
Provide a detailed work plan describing the tasks that will be undertaken to complete the proposed feasibility study. This should include as much specific information as possible on the types of tests and analyses that will be performed and the reports that you intend to produce as supporting documentation. Quarterly progress reports will be required and should be included as work tasks.

It is important to schedule tasks in a logical manner. If there are one or more potentially limiting factors in terms of feasibility, tasks examining those factors should be scheduled as early as possible in the feasibility study. If a determination is made following those tasks that there is no feasible project alternative, the study should be stopped at that point. Note that a feasibility study report is still required.

The feasibility study should examine Local Water Supply project alternatives from an engineering, hydrologic, economic, environmental, institutional, and social basis.

The completed study should provide most of the information needed to enable the applicant to complete a subsequent application for a Local Water Supply project alternatives from an engineering, hydrologic, economic, environmental, institutional, and Program construction loan for the preferred project alternative. The feasibility study applicant should review the application requirements for a construction project for this program and address all of the specific program requirements in the feasibility study work plan.

Typically, work plan tasks include:

- Identify the purpose of the feasibility study, including the need for a project; identify the goals to be obtained
- Review financial and technical background information
- Determine daily water usage and peak daily demand
- Develop and evaluate project alternatives
- Identify the preferred project alternative
- Determine the engineering and hydrologic feasibility of the preferred project alternative; include preparation of preliminary plans of sufficient detail to generate an engineer's cost estimate (typically, this ranges from a 10 to 30 percent plan level)
- Determine the economic costs and benefits of the preferred project alternative
- Determine the environmental impacts of the preferred project alternative; examine the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) requirements; if necessary, prepare an Initial Study for CEQA to determine if an Environmental Impact Report or a Negative Declaration needs to be prepared; develop mitigation measures if needed
- Determine which permits will be needed for the preferred project alternative
- Determine whether the preferred project alternative will comply with federal, State, and local laws, regulations, and guidelines
- Determine public support or opposition
- Determine ways to generate funds to finance the construction of the preferred project alternative
- Develop a work plan schedule
- Prepare quarterly progress reports, a draft feasibility study report, and a final feasibility report

Note: If the applicant has identified a preferred project alternative, the feasibility study funding may be issued to complete all necessary environmental documentation for the preferred project alternative, including CEQA/NEPA.

The feasibility study report should contain the results of all the work plan tasks, including the determination of whether the preferred project alternative is feasible.

Mark as Attachment B-3.

B-4
Timetable

Provide a timetable for accomplishing the specific tasks discussed in your feasibility study work plan. This should be realistic, especially if a number of preliminary studies must be accomplished before the feasibility study can be completed.

The timetable should show the start and end dates for the feasibility study milestones. DWR requires quarterly progress reports under this loan program. The timetable should preferably be in a horizontal bar chart format. Tasks may overlap.

The timetable should include benchmarks for the quarterly progress reports, a draft final report, a review of the draft by DWR, and a final report.

Mark as Attachment B-4.

Part C - Critical Need

Critical need is the same as "urgency of need" and means the **physical need** for the project in the community and the **financial need** of the applicant agency. Physical need is determined by the general state of the water system, adequacy of the water supply, dependency on the water supply, water quality conditions, and the availability of alternative supplies. Financial need is demonstrated by the applicant's inability to fund the project from other sources.

Critical need will be assessed using information supplied in this section and that received in Part A (*organizational/financial/legal information).*

C-1
Demonstration of financial need

Financial need is demonstrated in part by the applicant's inability to fund the project from other sources. In order to document an agency's financial need, please provide letters or other materials indicating the appropriate agency has sought financing from other sources and been advised that either funds are not available, or the agency does not qualify for a loan or grant under other applicable programs.

Mark as Attachment C-1.

C-2
Physical need for the proposed project

Include a detailed narrative description of the current preproject water system condition. Describe current sources of water and existing facilities. Also describe current and projected water needs. How will the proposed project meet these needs?

Mark as Attachment C-2.

C-3
Water conservation

Describe the agency's water conservation contingency plan and the best management practices (*BMP*s) it entails *(attach copy)*. How does this plan reduce the need to develop additional sources of water? For questions on water conservation plans and BMPs, contact David Todd, DWR, at (916) 651-7027.

Mark as Attachment C-3.

C-4
Substitute water supplies

Describe other sources of water available to the agency. Note how frequently each alternative source is used. Discuss the quantity and quality for each source, as well as other pertinent information.

What is the availability of substitute water supplies in an emergency situation? Where would this supply come from, and what would be the purchase price of this water? Describe the alternatives to the proposed project.

Mark as Attachment C-4.

C-5
Impacts of not doing project

Include a detailed narrative description of expected impacts within the community if the proposed project is not constructed. Factors impacted could include population, employment, business/industry, irrigated acreage, emergency water supplies, water quality, agency loss or gain of revenue, public safety, agricultural conversion to urban water uses, and the environment.

Mark as Attachment C-5.

Appendix I

Checklist of attachments

Complete this checklist to confirm all sections and attachments to this application package have been completed.

Part A—Organizational, Financial and Legal Information

- ☐ A-1 Application cover sheet
- ☐ A-2 Agency representatives
- ☐ A-3 Feasibility study cost
- ☐ A-4 Authorizing resolution
- ☐ A-5 Financial statements
- ☐ A-6 Cash reserves
- ☐ A-7 Existing debt
- ☐ A-8 Repayment method
- ☐ A-9 Loan security
- ☐ A-10 Rate and service structure
- ☐ A-11 Population data
- ☐ A-12 Agency authority
- ☐ Attachments A-1 through A-12

Part B—Feasibility Study Requirements

- ☐ B-1 Work plan
- ☐ B-2 Time schedule
- ☐ B-3 Description of project
- ☐ Attachments B-1 through B-3

Part C—Critical Need

- ☐ C-1 Demonstration of financial need
- ☐ C-2 Physical need for the proposed
- ☐ C-3 Water conservation
- ☐ C-4 Substitute water supplies
- ☐ C-5 Impacts of not doing project
- ☐ Attachments C-1 through C-5

Appendix II

Sample resolution

Resolution No. _____

Resolved by the _____
(Governing body, city council, or other)

of the _____
(Agency, city, county, or other)

that pursuant and subject to all of the terms and provisions of the California Water Conservation and Water Quality Bond Law of 1988 and amendments thereto, application by this _____
(Agency, city, county, or other)

be made to the California Department of Water Resources to fund a local water project supply feasibility study.

The _____ of the
(Presiding officer, president, city manager, or other official)

_____ is hereby authorized and directed to
(Agency, city, county, or other)

prepare the necessary data, make investigations, sign, and file such application with the California Department of Water Resources.

Passed and adopted at a regular meeting of the _____
(Board of Directors, Supervisors, etc.)

of the _____
(Agency, city, county, or other)

on _____ .
(Date)

affix official seal here

Authorized Signature _____

Printed Name _____

Title _____

Clerk/Secretary _____

Appendix III

Sample feasibility study workplan

SCOPE OF SERVICES
FOR
THE NONPOTABLE RECLAMATION AND REUSE
PROJECT FACILITY PLAN

This task order provides for engineering services for the nonpotable reclamation and reuse project facility plan. The funding request includes a reclaimed water market assessment and distribution system assessment. Following is a list of specific work elements to be performed.

MARKET ASSESSMENT

Objective: The objective is to review and refine the identified nonpotable reuse opportunities in the vicinity of the Golden Triangle. Additional sites in the Evergreen Valley area will also be reviewed. Identify and quantify constraints set by potential users and cost impacts to potential users.

INVENTORY EXISTING RECLAMATION PROGRAMS

The inventory will include representative existing reclamation programs that have been implemented elsewhere in California.

Contacts will be made to obtain the following types of information:

- Examples of interagency contractual agreements
- Examples of contractual agreements between water wholesalers and retailers
- Examples of incentives offered to reclaimed water users
- Examples of local legislation related to use of reclaimed water
- Examples of wording used in “Letter of Intent”

INVENTORY POTENTIAL USERS AND USE

Potential uses to be inventoried in the vicinity of the Golden Triangle include colleges, schools, parks, cemeteries, golf courses, industrial/business park landscaping, and industrial process. The potential sites will be identified assuming that a dual distribution system is implemented.

Based on the estimated water quality of the reclaimed water, possible restrictions of the use or the need for special application requirements will be described. Before beginning this inventory, verify projected reclaimed water quality (such as chlorides) that will affect the ability to reuse the reclaimed water for irrigation.

Appendix III

Sample feasibility study workplan

A. Survey Potential Users

Contacts with potential users will be made to obtain the following information:

- Amount of water needed, including the timing and reliability of the need
- Water quality required
- Onsite modifications needed to use reclaimed water
- Their cost of existing water supply
- Willingness to use reclaimed water
- Price willing to pay for reclaimed water
- Incentives necessary to encourage use

B. Survey Water Purveyors

Contact water purveyors that will be impacted by the potential implementation of nonpotable reuse. These purveyors include City of San Jose, City of Santa Clara, City of Milpitas, and San Jose Water Company. Information will be obtained regarding coordination with potable facilities and impacts to their operations. Define a preliminary set of responsibilities between the water wholesaler and purveyors.

ESTIMATE DEMAND AND REQUIRED QUALITY FOR RECLAIMED WATER

Based on the information gathered above, an estimate of how many users are willing and able to use reclaimed water will be made. Prepare estimates based on water use as a function of incentives offered. Possible barriers to utilization of reclaimed water will be identified. These uses will then be further investigated to verify the quantity of water that can be supplied and the compatibility of the proposed use with health regulations and good agronomic practice. Possible quality restrictions regarding use and application will be defined. Special treatment required for use in industrial processes will be identified. Identify operational costs (due to changes in procedures or equipment) that may be incurred by the user.

SITE SUITABILITY INVESTIGATION

Once the potential market for reclaimed water has been defined in the previous tasks, the sites that have indicated an interest in receiving reclaimed water will be evaluated for suitability.

A. Perform site soils investigation. Site soils will be characterized by a soil scientist to determine general suitability for use of reclaimed water. The soils will be determined to either native or imported fill material.
B. Assess suitability of landscaping for reclaimed water use. Some landscaping plants are sensitive to the use of reclaimed water, generally due to salinity, boron, or chloride levels. Recommendations for landscaping modifications will be prepared if incompatibility is determined. Make recommendations for required landscaping changes.

Appendix III

Sample feasibility study workplan

OBTAIN LETTER OF INTENT

In implementing a reuse project, one of the critical path items is obtaining long-term agreements for use of the reclaimed water. As a first step in obtaining those long-term agreements, we recommend that letters of intent be obtained from the potential reclaimed water users in the project area. The letters of intent will contain many of the important terms that would become part of the long-term agreement for the reuse system. Obtaining letters of intent at this stage of the project is important because it allows the project implementation to continue unimpeded if the time period for obtaining agreements were to become extended when the actual contract agreements have to be obtained. By negotiating the general terms of the future agreements at this stage, delays in later stages of the project can potentially be avoided. Therefore, a relatively intensive level of effort is recommended for this task. The effort includes drafting letters of intent, reviewing them when the DISTRICT/CITY's attorney, meeting with the potential users, and obtaining signatures from the reclaimed water users. The individual work tasks are as follows:

A. Prepare Draft Letter

   Prepare a preliminary draft letter of intent outlining the critical points necessary for the DISTRICT/CITY to provide reclaimed water to users, including terms of delivery, obligations of the DISTRICT/CITY, obligations of the user, conditions of delivery, and requirements of reclaimed water use. Review the draft letter with DISTRICT/CITY's attorney. Prepare final draft letter of intent for negotiation with users.

B. Negotiate Letters of Intent

   The draft letter of intent will be taken to the users in the project area. This will occur collectively in meetings and individually. It is anticipated that the DISTRICT/CITY staff will have to be consulted periodically during this process. The objective is to obtain commitments from the users that will assure both the DISTRICT/CITY and the users that the project is viable and implementable form the standpoint of having a workable, cooperative understanding of the requirements of the project.

C. Obtain Final Letters of Intent

   After all of the points have been agreed upon, a signed letter of intent will be obtained individually from each user.

· Prepare technical memorandum summarizing the user interest in reclaimed water.

Appendix III

Sample feasibility study workplan

BASE MAP PREPARATION

In order to accurately define the potential sites for using reclaimed water in the Golden Triangle, preliminary design base maps should be prepared. The base maps for the delineation of user sites and pipeline distribution system will be prepared in this task.

A. Rectified photo base maps of the project area at a scale of 1"=200' will be prepared. No survey control will be provided for this stage of the project.

   Scaling factors for the orthophotos will be developed from the USGS quadrangle maps for the area.

B. Reproducible mylars on a standard engineering sheet (22"x 34") will be produced from the rectified photos. Two sets of photo negatives will be prepared for use in the field by market assessment team and the pipeline alignment team.

DISTRIBUTION SYSTEM ASSESSMENT

Objective: The objective of this work element is to assess the conceptual design requirements for the distribution system required to deliver reclaimed water to the nonpotable reuse opportunities identified in the Golden Triangle.

DEFINE DESIGN CRITERIA

Design criteria for the distribution system will be defined in this task. These design criteria will be used to develop the recommended distribution system characteristics. Design criteria addressed in this task will include:

- CITY's, DISTRICT's, and water purveyor's requirements for pipeline systems, including minimum diameters, pipeline materials, standard installation details, and rights-of-way requirements.
- User requirements for irrigation systems, including minimum delivery pressures daily demand variation, onsite storage opportunities, and integration of reuse system into onsite control and facilities operation.
- Regulatory requirements for reclaimed water systems, including minimum separation from potable water lines, pipeline materials, color coding, valving and facility delineation, and backflow requirements.
- Process requirements including frictional loss factors, minimum and maximum pipeline velocities, constructability aspects of pipeline installation, delivery pumping characteristics, and operational storage requirements.

Appendix III

Sample feasibility study workplan

PRELIMINARY PIPELINE ALIGNMENT EVALUATION

The preliminary pipeline alignment for the distribution system will be defined in this task. The pipeline alignment will be developed to deliver water to the potential reclaimed water users identified in Work Element 1.

A. Contact water purveyors, CITY, DISTRICT, and utility companies to obtain existing utility information within the project area.

B. Field review of potential pipeline corridors to generally identify the major utilities that will likely be encountered along a given pipeline corridor. Identify likely bore and jack crossing requirements. Prepare notes from the field review.

C. Obtain available information from the files of the appropriate jurisdiction regarding existing rights-of-way. Evaluate easement requirements for various pipeline corridors. Identify significant right-of-way or easement constraints within the pipeline corridors. Review easement requirements with the appropriate jurisdiction.

D. Develop pipeline alignment options. Review alignment options with staff of the appropriate jurisdiction. The intent of this review is to determine if there are any significant constraints to locating pipelines in the various possible pipeline corridors.

E. Select preliminary pipeline alignments for use in hydraulics analysis.

PRELIMINARY HYDRAULICS ANALYSIS

The preliminary hydraulics analysis for the distribution system will be developed in this task. A pipeline network model of the distribution system will be developed for computer analysis of the various hydraulic conditions of the distribution system. No surge analysis will be performed at this stage of the investigation. Surge analysis will be left for final design of the reuse facilities.

A. Develop minimum pipeline sizes and pressure classification from the hydraulics analysis.

B. Develop system curves for the distribution pump station. These curves will be used to develop the preliminary size of the distribution pump station and to select the pump station equipment.

C. Develop minimum operational storage requirements at the distribution pump station.

D. Assess the potential for booster pump stations within the distribution system to provide minimum pressure requirements at the outer zones of the system.

E. Assess the potential for operational storage within the distribution system to optimize the system. Initial assessment of these requirements will be prepared in this task. A detailed assessment of the potential storage system requirements will not be performed until final design of the facilities.

PRELIMINARY GEOTECHNICAL INVESTIGATION

A preliminary geotechnical investigation for the distribution system will be performed in this task. The geotechnical investigation will consist of the following:

A. Review existing geotechnical information available from previous construction projects within the Golden Triangle. The various city agencies will be contacted for this information. Conclusions and recommendations for the distribution pump station foundation, pipeline construction (including ground design criteria), and bore and jack crossings will be prepared.

B. Identify additional investigations that may be required either for preliminary or final design.

CONCEPTUAL DESIGN DEVELOPMENT

Prepare a set of preliminary design drawings for the distribution system. The drawings will be present the conceptual development of the project consistent with the criteria and recommendations developed from this Work Element.